

What is claimed is:

1. A tilt compensator and delay element for use in an interferometer passing a light beam through a beam splitter and reflecting the light beam with at least two mirrors positioned in a first plane, the tilt compensator and delay element comprising:  
an odd number of mirrors including at least three mirrors, the mirrors being positioned to receive at least a portion of the light beam and to reflect at least a portion of the light beam out of the first plane and to reflect the light beam back into the first plane so as to provide tilt correction and to delay the light beam.
2. The tilt compensator and delay element of claim 1, wherein the mirrors are positioned to reflect the light beam about 90 degrees out of the first plane.
3. An interferometer, comprising:  
a beam splitter receiving a light beam and splitting the light beam into a first light beam and a second light beam;  
a scanning mirror having a sustainable oscillating movement, the scanning mirror having two opposing planar reflecting sides;  
a plurality of steering mirrors for reflecting the first light beam to one of the opposing planar reflecting sides, and the second light beam to the

other one of the opposing planar reflecting sides, the steering mirrors being provided in a first plane; and

a tilt compensator and delay element receiving one of the first light beam and the second light beam, the tilt compensator and delay element reflecting the one of the first light beam and the second light beam out of the first plane and reflecting the one of the first light beam and the second light beam back into the first plane so as to provide tilt correction and to delay the one of the first light beam and the second light beam.

4. The interferometer of claim 3, wherein the tilt compensator and delay element is positioned between one of the steering mirrors and the scanning mirror.

5. The interferometer of claim 3, wherein the tilt compensator and delay element is positioned between a pair of the steering mirrors. The interferometer of claim 3, wherein the tilt compensator and delay element passively compensates for tilt of the scanning mirror in two axes.

6. The interferometer of claim 3, wherein the interferometer is a normal Genzel arrangement interferometer.

7. The interferometer of claim 6, wherein the tilt compensator and delay element is positioned between one of the steering mirrors and the scanning mirror.

8. The interferometer of claim 6, wherein the tilt compensator and delay element is positioned between a pair of the steering mirrors.

9. The interferometer of claim 3, wherein the interferometer is a 1 axis correcting Genzel Michelson scanning interferometer.

10. The interferometer of claim 9, wherein the tilt compensator and delay element is positioned between one of the steering mirrors and the scanning mirror.

11. The interferometer of claim 9, wherein the tilt compensator and delay element is positioned between a pair of the steering mirrors.

12. The interferometer of claim 3, wherein the interferometer is a Genzel Mach-Zehnder interferometer.

13. The interferometer of claim 12, wherein the tilt compensator and delay element is positioned between one of the steering mirrors and the scanning mirror.

14. The interferometer of claim 12, wherein the tilt compensator and delay element is positioned between a pair of the steering mirrors.

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